May 31, 2013

**VIA FEDEX:**
**TRACKING NO. 8025 3400 9324**
Air and Radiation Division
EPA Region 5
77 West Jackson Blvd. (AE-17J)
Chicago, IL 60604
Attn: Compliance Tracker

**TRACKING NO. 8025 3400 9335**
Office of Regional Counsel
EPA Region 5
77 West Jackson Blvd. (C-14J)
Chicago, IL 60604



RE: *United States v. SABIC Innovative Plastics US LLC, et al.*, No. 3:12-cv-76
Burkville, Alabama plant
Submission of Final Corrective Action Plan

Pursuant to Paragraph 50(b) of the Consent Decree in the above-referenced matter, enclosed is the final Corrective Action Plan (CAP) of the Burkville, Alabama plant. This final CAP is the result of the first annual third-party LDAR audit conducted at the Burkville facility pursuant to the Consent Decree. The LDAR Audit Commencement Date was October 8, 2012, which makes June 5, 2013 the deadline to submit the final CAP. Therefore, this submission is timely.

Please contact me at (334) 832-5600 if you have any questions.

CERTIFICATION: I certify under penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that this document and its attachments were prepared either by me personally or under my direction or supervision in a manner designed to ensure that qualified and knowledgeable personnel properly gather and present the information contained therein. I further certify, based on my personal knowledge or on my inquiry of those individuals immediately responsible for obtaining the information, that the information is true, accurate, and complete.

John A. Curvey
Site General Manager

cc with encl.: loukeris.constantinos@epa.gov
daugavietis.andre@epa.gov

**SABIC Innovative Plastics US LLC**
1 Plastics Drive
Burkville, AL 36752
T: 334 832 5600
F: 334 832 5607
E: john.curvey@sabic-ip.com
www.sabic-ip.com

# SABIC Burkville Final Corrective Action Plan

**To: File for Consent Decree – Enhanced LDAR Program**

**From: Cammie Ashmore**

**Date: April 12, 2013**

## Background

The Burkville site is subject to certain requirements pursuant to the Consent Decree in United States of America v. SABIC Innovative Plastics US LLC (SABIC US) and SABIC Innovative Plastics Mt. Vernon, LLC (SABIC MTV) (Civil Action No. 3:12-cv-00076, United States District Court, Southern District of Indiana; effective December 5, 2012); the requirements of SABIC US apply to Burkville. One such requirement is that Burkville was required to have a third party conduct an audit of the LDAR program at the Covered Process Units (the Phosgene and Resin plants) pursuant to Paragraphs 46-49 of the Consent Decree (which includes conducting comparative monitoring in the Covered Process Units). If the results of the audit identified any deficiencies or if any of the Comparative Monitoring Leak Ratios are 3.0 or higher, then Burkville is required to develop a preliminary Corrective Action Plan (CAP) according to the requirements found in Paragraph 50 of the Consent Decree.

Burkville contracted with Trihydro to conduct the third-party LDAR audit (commenced October 8, 2012), and the audit identified some deficiencies (however, none of the Comparative Monitoring Leak Ratios was 3.0 or higher). Thus, a preliminary CAP was required, and was to have been prepared by March 7, 2013, which was done.[1]

The preliminary CAP had to describe the actions that have been taken or will be taken to address the deficiencies. Also, a schedule had to have been included by when actions that had not yet been completed would be completed. Each corrective action item had to have been completed promptly, with the goal of completing each action item within 90 days after the LDAR Audit Completion Date.

This document is the final CAP, which must be submitted to EPA by no later than 120 days after the LDAR Audit Completion Date (by June 5, 2013).

Note that this CAP addresses only Burkville. The Mount Vernon site will deal with its requirements under these paragraphs of the Consent Decree separately.

## Deficiencies Identified and Corrective Actions

Listed below are the three deficiencies identified in the LDAR Audit and their corresponding corrective actions either taken or to be taken:

[1] The deadline to prepare the preliminary CAP was 30 days after the LDAR Audit Completion Date, which was February 5, 2013. The Consent Decree defines the LDAR Audit Completion Date as 120 days after the LDAR Audit Commencement Date, which as noted was October 8, 2012.

- **Deficiency 1:** The unsafe-to-monitor plan indicates that at no time is it safe to monitor components located in the enclosures in the Resin and Phosgene Units. While the control system for the enclosures (they are vented to a caustic scrubber) appears to meet the requirements of section 63.1016(a) of Subpart TT for the components in phosgene service, it is unclear whether the system meets the Subpart TT requirements for TEA or for section 63.179 of Subpart H for controls for the components in $MeCl_2$ service. As access is allowed for some individuals into the enclosures, there is a discrepancy related to whether or not these components can be monitored.

**Corrective Action 1:** Determine whether there is a discrepancy related to whether the components in TEA or $MeCl_2$ service inside the enclosures can be monitored safely.

First, it should be noted that no components in TEA service are located inside an enclosure. This was communicated to the United States Environmental Protection Agency (U.S. EPA) in a letter dated March 9, 2007:

*"As an initial comment, please note that there are no LDAR components in triethylamine service located inside an enclosure where phosgene is used. The only HAP (besides phosgene) used inside the enclosure is methylene chloride."*

There are some lines to the reactor inside the enclosures that formerly contained TEA, but these lines have been abandoned in place and are out of service. It is estimated that this change (no TEA lines in service in the enclosures) occurred around 2003. The TEA lines now route to the formulation area outside of the enclosures and are being monitored. A review of the relevant P&IDs confirms that the concentration of TEA in the lines from the formulation area to the reactors inside the enclosure is < 0.1%.

There are components in $MeCl_2$ service inside the enclosures. However, they are unsafe-to-monitor (UTM) for the following reasons:

- In the 2007 letter to EPA, GE explained why the components in $MeCl_2$ service inside an enclosure are UTM: *"If there is any phosgene present in an enclosure (whether liquid or vapor), GE safety rules require that extensive personal protective equipment (PPE), consisting of self-contained breathing apparatus with full-face mask, personal phosgene monitor, and phosgene exposure tags inside and outside the mask, be worn inside the enclosure. Of course, the fact that self-contained breathing apparatus is required due to safety considerations means that components inside the enclosure in methylene chloride service are 'unsafe to monitor'."* The facts in this statement are still correct, and still support the conclusion that the $MeCl_2$ components are UTM. As an FYI, GE never received (and SABIC has never received) any response to this interpretation. To be

conservative, we do not interpret the lack of a response as an endorsement or agreement by EPA of the interpretation.

- Independent of the reason above, which we believe is sufficient on its own to justify the UTM conclusion, other factors also support the conclusion. The first is the physical condition that a Monitoring Technician (MT) must have. Prior to using respiratory protection, all personnel (whether a contractor or a SABIC employee) must undergo respirator fit testing and a respiratory demand test. The latter tests for physical fitness for wearing respiratory protection and walking around. Thus, good physical condition is necessary for being able to work safely inside an enclosure.

- Also relevant to physical condition is the weight that a MT would be required to carry in order to perform monitoring. The LDAR monitoring equipment the MT must use weighs approximately 19 pounds. In addition, the required respiratory protection equipment adds to the load the MT must carry, up to as much as 31.5 pounds in the case of an SCBA. Thus, combined with the weight of the LDAR monitoring equipment, the MT could need to carry as much as 50 pounds. Carrying this amount of weight would be physically draining for the MT while conducting monitoring. In addition, the MT would not monitor in only one location inside the enclosure. Instead, the MT would be moving from component to component, which increases the physical demands of monitoring inside an enclosure.

- The alternative of supplied air in place of an SCBA reduces the weight of the respiratory protection equipment because a large SCBA tank is not required, but the MT must then pull along an air hose and carry a 5-minute escape bottle. The air hose is hooked to a connection on the inside wall of the enclosure that receives air from a bottled air supply located outside the enclosure. However, the air hose introduces a different risk, in the form of an entanglement hazard of the hose with equipment and structures inside the enclosure and with the MT himself and would impede the rescue of a downed MT in a potentially IDLH atmosphere.

- The bulk of the respiratory protection and monitoring equipment hinder the MT's ability to move easily and safely inside an enclosure. The combination of the weight and the ergonomically awkward positions to perform the appropriate M21 monitoring, the bulk of the respiratory protection and monitoring equipment, and frequent movement inside the enclosure to access components, present a constant risk. In addition, the full-face masks that must be worn restrict the MT's ability to see, increasing the risk of tripping and falls. As evidence of this, on December 1, 2012, an experienced SABIC-Burkville employee tripped over a metal footstool while walking inside a Resin Plant enclosure. He grabbed a support stand in an attempt to break his fall. The employee suffered a torn bicep connective tendon in an arm, which will require surgery. The incident was caused by the job-specific required PPE (the employee's full-face mask) in the phosgene

enclosure which limits side vision. In this case, the employee was not carrying the LDAR monitoring equipment that a MT would be required to have.

- The enclosures are not air-conditioned. In the summer, the temperature can be very warm, which adds to the physical strain of conducting monitoring and carrying bulky equipment.

- Because of the inherent risks inside the enclosures, an enclosure watch in the same level of PPE is required to be stationed outside the enclosure to monitor the activity of contractors that enter the enclosures.

- Some of the enclosures have platforms inside them, which are accessed by stairs or ladders. Accessing these platforms while wearing the respiratory protection and carrying an LDAR monitoring device would be a challenge for an MT, even if the LDAR monitoring device were lifted in a bucket up to the platform (climbing a ladder while holding the LDAR monitoring device would violate safety policy; it could be carried over a shoulder or lifted in a bucket).

- Monitoring after purging phosgene from the components inside the enclosures is not an option. During normal shutdowns at the Resin/Phosgene plant, most phosgene lines are only purged of liquid inventory. Typically, only the lines that are specifically going to be opened and worked on during the outage are totally cleared of phosgene vapor. This leaves many lines in the enclosures containing small, but still potentially hazardous, amounts of phosgene. Further, there is not an opportunity to monitor the components in $MeCl_2$ service during the shutdown because shutdown procedures require that the $MeCl_2$ lines be purged and flushed prior to purging and flushing the phosgene lines.

Even if the site decides to remove all the phosgene in the enclosure, the safety rules typically still require that the above-described PPE be worn as protection against potential exposure. This rule was occasioned by an incident in 1989. During the shutdown that year, SABIC attempted to have "open" enclosures (all phosgene liquid and vapor purged so that no PPE was required to be worn), but had to close them in less than 24 hours due to low levels of phosgene being detected. From that point forward, SABIC has opened enclosures (i.e., allowed entry without the use of the above-described PPE) where phosgene is processed only when it is necessary to remove and/or install equipment that can not physically be moved through a door (i.e., reactor/condenser replacement). Replacing this type of equipment is not a common activity.

However, even though the LDAR components in the enclosures are deemed UTM, a leak of methylene chloride inside an enclosure does not go unnoticed. As outlined in the March 9, 2007 letter to U.S. EPA, the phosgene enclosures that contain methylene chloride piping are equipped with continuous methylene chloride multi-point analyzers. The analyzers are set to alarm at 25 ppm, which will alert operators to the existence of small leaks. When an alarm sounds, the

operations team dons PPE and enters the enclosure with hand-held methylene chloride monitors to identify the leak source. If operations is unable to repair the leak in its initial attempt, maintenance is contacted to suit up and repair or replace the equipment.

- **Status:** Completed

- **Deficiency 2:** The initial repair attempts for two components (valve 106062, discovered leaking on April 10, 2012; and pump 106100, discovered leaking on June 21, 2011) were not completed within the five-day time limit.

**Corrective Action 2:** SABIC was aware of both deficiencies prior to the audit. Component 106100, a pump in light liquid service, was discovered leaking visually on June 21, 2011. A first repair attempt is required to be performed within five days after discovery of a leak. However, the initial repair attempt, which successfully stopped the leak, was performed three days late (on June 29, 2011), most likely due to insufficient communication between the LDAR contractor and Operations. This failure was reported to ADEM in the June 16, 2011 to December 15, 2011 Title V Semi-Annual Deviation Report.

Component 106062, a control valve in gas/vapor service, was discovered leaking by instrument monitoring on April 10, 2012 and a work order to repair the valve was entered by the LDAR contractor. On April 12, 2012, operations personnel made a repair attempt on the valve and contacted the LDAR contractor to request re-monitoring of the valve to see if the repair attempt was successful. However, the wrong work order was referenced in the request for re-monitoring. This subsequently led to a miscommunication between the on-site LDAR contractor (monitoring technician) and Operations regarding the re-monitoring. The re-monitoring of the control valve to validate the repair attempt was due by April 15, 2012; however, the valve was not re-monitored until April 16, 2012, one day late. The monitoring did confirm that the April 12$^{th}$ repair attempt was successful, so the leak was actually repaired within two days of its discovery. Thus, no excess emissions occurred as a result of the re-monitoring occurring one day late. This was reported to ADEM in the December 16, 2011 to June 15, 2012 Title V Semi-Annual Deviation Report.

A number of program improvements have been implemented since these two events, including adding two full-time LDAR technicians as well as an LDAR Coordinator to the team. The LDAR Coordinator and/or the LDAR Contractor reviews the LDAR database on a daily basis during the work week (Monday to Friday) to help track due dates relative to the 5-day and 15-day regulatory deadlines. The monitoring technicians have been reminded of the requirement to conduct follow-up monitoring in a timely manner. Further, an updated point of contact list was provided to the contract monitoring technicians so they are aware of the appropriate operations personnel to contact to confirm that repaired components are ready for re-monitoring.

- **Status:** Completed.

- **Deficiency 3:** The 37 components listed in Attachment 1 were identified as having missed monitoring events between the date of the last monitoring before the missed monitoring event and the date of the first monitoring event after the miss. These components had missed monitoring events because their associated process line was missed during the initial equipment applicability determination review.

  **Corrective Action 3:** Of the 37 components, only 5 components (1 pump and 4 connectors) actually had missed monitoring events (see bold rows in Attachment 1). SABIC was aware of these deficiencies prior to the audit. These missed monitoring events occurred around 2 years ago when the site failed to include certain process lines when it re-tagged the equipment in the Resin plant. Once SABIC identified this miss in late September 2012, Operations undertook a focused effort to re-review all Resin Plant Process & Instrumentation Diagrams (P&IDs) prior to the end of the third quarter of 2012 to minimize missed monitoring events. These were reported to ADEM in the June 16, 2012 to December 15, 2012 Title V Semi-Annual Deviation Report.

  - **Status:** Completed.

## Comparative Monitoring

Per Paragraph 50 of the Consent Decree, if the "Comparative Monitoring Leak Ratio" for any Covered Type of Equipment in either Covered Process Unit is 3.0 or higher, then corrective actions must be identified to address the deficiencies and/or causes. However, the results of the comparative monitoring showed that no component type had a leak ratio of 3.0 or higher. In fact, in every instance, the auditors observed a lower leak rate than that observed by SABIC US during the time periods reviewed (i.e., the Comparative Monitoring Leak Ratio was less than 1.0). Thus, there are no corrective actions identified arising out of the comparative monitoring conducted during the audit.

# Attachment 1 – List of Components with Missed Monitoring Events

| Unit | Tag # | Component Type | Last monitoring before miss | First monitoring after miss | Missed Monitoring Events |
|---|---|---|---|---|---|
| Plant 2 | 105334-000 | Instrumentation System | Exempt component type | | None |
| Plant 2 | 105343-001 | Instrumentation System | Exempt component type | | None |
| **Plant 2** | **105350-000** | **Pump** | **09/07/2011** | **9/18/2012** | **11** |
| Plant 2 | 105350-001 | Connector | 09/22/2009 | 9/21/2012 | None* |
| Plant 2 | 105350-002 | Connector | 09/22/2009 | 9/21/2012 | None* |
| **Plant 2** | **105350-003** | **Connector** | --- | **9/24/2012** | **2 in past 5 years** |
| Plant 2 | 105351-000 | Valve | 06/24/2011 | 9/21/2012 | None** |
| Plant 2 | 105351-001 | Connector | 06/24/2011 | 9/21/2012 | None* |
| Plant 2 | 105351-002 | Connector | 06/24/2011 | 9/21/2012 | None* |
| Plant 2 | 105351-003 | Open-Ended Valve or Line | Exempt component type | | None |
| Plant 2 | 105352-000 | Valve | 06/24/2011 | 9/21/2012 | None** |
| Plant 2 | 105352-001 | Connector | 09/08/2011 | 9/21/2012 | None* |
| Plant 2 | 105352-002 | Connector | 09/08/2011 | 9/21/2012 | None* |
| Plant 2 | 105352-003 | Connector | 09/22/2011 | 9/21/2012 | None* |
| Plant 2 | 105352-004 | Open-Ended Valve or Line | Exempt component type | | None |
| Plant 2 | 105353-000 | Valve | 06/24/2011 | 9/24/2012 | None** |
| Plant 2 | 105353-001 | Connector | 09/22/2009 | 9/21/2012 | None* |
| Plant 2 | 105353-002 | Connector | 09/22/2009 | 9/21/2012 | None* |
| Plant 2 | 105353-003 | Connector | 09/22/2009 | 9/21/2012 | None* |
| Plant 2 | 105354-000 | Valve | 06/24/2011 | 9/24/2012 | None** |
| Plant 2 | 105355-000 | Connector | 09/06/2011 | 9/21/2012 | None* |
| Plant 2 | 105356-000 | Valve | 06/24/2011 | 9/24/2012 | None** |
| Plant 2 | 105356-001 | Connector | 09/06/2011 | 9/21/2012 | None* |
| Plant 2 | 105356-002 | Connector | 09/06/2011 | 9/21/2012 | None* |
| **Plant 2** | **105356-003** | **Connector** | --- | **9/21/2012** | **2 in past 5 years** |
| Plant 2 | 105356-004 | Open-Ended Valve or Line | Exempt component type | | None |
| Plant 2 | 105357-000 | Valve | 06/24/2011 | 9/24/2012 | None** |
| Plant 2 | 105357-001 | Connector | 09/06/2011 | 9/21/2012 | None* |
| Plant 2 | 105357-002 | Connector | 09/06/2011 | 9/21/2012 | None* |
| Plant 2 | 105357-003 | Connector | 09/06/2011 | 9/21/2012 | None* |
| Plant 2 | 105357-004 | Connector | 09/06/2011 | 9/21/2012 | None* |
| Plant 2 | 105357-005 | Connector | 09/06/2011 | 9/21/2012 | None* |
| Plant 2 | 105357-006 | Connector | 09/06/2011 | 9/21/2012 | None* |
| Plant 2 | 105357-007 | Connector | 09/06/2011 | 9/21/2012 | None* |
| **Plant 2** | **101793-003** | **Connector** | --- | **9/20/2012** | **2 in past 5 years** |
| Plant 2 | 103823-001 | Connector | 12/16/2011 | 9/18/2012 | None* |
| **Plant 2** | **103825-003** | **Connector** | --- | **9/18/2012** | **2 in past 5 years** |

* The connector monitoring period is every 2 years (i.e., October 1, 2008 to September 30, 2010; October 1, 2010 to September 30, 2012). This connector was monitored once during each biennial period.

**The valve monitoring period was annual (i.e., April 1, 2011 to March 31, 2012) and changed on April 1, 2012 to semi-annual (i.e., April 1, 2012 to September 30, 2012). This valve was monitored once during each of these monitoring periods.